

(c) Remarks

The pending claims under examination are 1, 3, 5 and 17 with claims 1 and 17 the independent claims. Non-elected claims 7-16 have been cancelled as suggested.

Reconsideration of the claims is expressly requested.

Claims 1, 3, 5 and 17 were rejected as obvious over Stucky '705 in view of Nogues '980 and Miyata. Claims 1, 3, 5 and 17 were provisionally rejected as an obviousness-type double patenting of Claims 1-4 and 7 of Application Number 11/267,156 ('156 Application) in view of Miyata. All the grounds of rejection are respectfully traversed.

In order to achieve a prima facie case of obviousness, the prior art must suggest to the artisan each of the claimed steps of the present claimed process. One step of the claimed process provides for applying the reactant solution onto a substrate having a capability of orienting an aggregate of the surfactant in a predetermined direction. Another step involves forming the mesostructured film having aggregates of the surfactant oriented in a predetermined direction while retaining the substrate in a water-vapor containing atmosphere at a relative humidity of 40% to 100%.

Accordingly, it is critical that the substrate on which the film is formed be capable of orienting the aggregate in a predetermined direction. This can be achieved by employing a substrate with a coating which has been rubbed in a given direction. In addition, the mesostructured film is formed utilizing a hydrothermal process (in a water-vapor containing atmosphere).

The only applied reference which refers to those substrate alignment and thermal features is Miyata. Miyata is cited for a polyimide film heated with rubbing for alignment control. Miyata also teaches heating the substrate at 80°C after the reaction solution was applied

in a sealed vessel. Stucky and Nogues teach a sol-gel technique. In Nogues, a sol is cast into a model; the sol is gelled by cross-linking; the gel is aged; the aged gel is then heated at a high humidity and then heated at a low humidity to dry it. Nogues does not teach the sequence of employing an oriented substrate to remove a solution and then forming a mesostructured film (not a cross-linked gel) by exposure to a high-humidity atmosphere.

Applicant will show that Miyata is non-analogous art and cannot be properly combined with Stucky and Nogues. Therefore, a prima facie case of obviousness is not raised.

Miyata is non-analogous art when compared to the other applied prior art references and the Applicant's invention. To rely on a reference in an obviousness rejection, the citation must be analogous prior art. M.P.E.P. 2141.01(a). The relevant prior art to be considered in determining whether an invention is obvious to a person with ordinary skill in the art must be analogous art; that is it must be within his field of endeavor or, if not, it must be pertinent to the problem the inventor was trying to solve. *Libbey-Owens-Ford Co. v. The BOX Group, Inc.*, 655 F. Supp. 897, 906 (D.N.J. 1987); *see also In Re Clay*, 966 F.2d 656 (Fed. Cir. 1992). The combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a prima facie case of obviousness. *In Re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992).

Courts have held that references are non-analogous where they differ significantly in operating parameters such as pressure, voltage, and magnetic field strength, even though both references employ the same physical process. *Libbey-Owens*, 655 F. Supp. at 912 (ion pump and sputter coating apparatus are non-analogous even though both have a common origin, and both employ the same process, but differ fundamentally in their mode of operation); *also see Maxon Premix Burner Co., Inc. v. Mid-Continent Metal Products Co.*, 279 F. Supp 164, 187-191

(N.D.III. 1967) (jet engine combustion devices are non-analogous art to gas burner for heating where they have “different performance characteristics, operating principles, and environmental conditions”); *In Re Oetiker*, 977 F.2d at 1446-1447 (a person of ordinary skill, seeking to solve a problem of fastening a hose clamp, would not be expected or motivated to look to fasteners for garments, even though both relate to a hooking problem); *In Re Falls*, 332 F.2d 833, 836-837 (C.C.P.A. 1964) (heating to ‘cure or convert’ organo-silicon compound to set it on a glass fiber surface is not analogous to heating to remove organic size from a fiber glass fabric).

The Examiner agrees both Stucky and Nogues are drawn to methods to produce stable sol-gel structures. In particular, Stucky is directed to the synthesis of a silica sol-gel. *See* p. 39, l. 16; p. 41, l. 20; p. 42, ll. 16-17; p. 50, ll. 8-14 (two step sol-gel chemistry); and p. 57, l. 30. Nogues provides “a method of preparing oxide sol-gel monoliths which avoid[] cracking problems.” *See* Nogues, col. 1, ll. 59-61. The Applicant’s invention is directed to the synthesis of a thin film non-silica material having an uniaxially aligned tubular pores. *See* p 4., ll. 2-6. In contrast, Miyata teaches the alignment of hexagonal mesoporous silica particles, where the silica is formed by the hydrolysis of silicon alkoxide in the presence of surfactants under acidic conditions. *See* Miyata, p. 1610. Further, Miyata utilizes a thermal synthesis technique to form the hexagonal mesoporous silica particles, in contrast to the sol-gel method used by both Stucky and Nogues.

Miyata is outside the field of Applicant’s invention, and therefore is non-analogous art. Further, Miyata is directed to alignment of a silica film. As noted on page 3 of Applicant’s specification, it was unknown whether other films, such as metal oxides, could be formed into uniaxially aligned tubular pores. Such had not been demonstrated when the present invention was made.

Moreover, it was unknown if a mesostructured material or a metal oxide could be formed with metal oxide crystallites in the pore wall. Miyata is not directed to the problem of forming pores with metal oxide crystallites in the pores. To solve this problem applicant was required, *inter alia*, to devise a hydrothermal process in which the reaction solution is maintained at a high humidity of 40% to 100%. Such teaching is not found in Miyata or in the cited references.

Therefore, none of the cited references are directed to the problem of forming a mesostructured (non-silica) metal oxide film by a hydrothermal process in which metal crystallites are present in the pore walls.

In summary, the references differ from applicants invention and from each other significantly such that they are non-analogous to the present invention, and at least Stucky and Nogues are non-analogous also to Miyata. The references are not pertinent to the problem to be solved; forming a metal oxide film via a hydrothermal process on an aligned substrate to achieve a mesostructured film. The combination of elements from non-analogous sources, such as Miyata, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a prima facie case of obviousness. *See In Re Oetiker*, 977 F.2d at 1447.

Accordingly, the art rejection, having been overcome, should be withdrawn.

Claims 1, 3, 5 and 17 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, and 7 of copending Application No. 11/267156 in view of Miyata. The Examiner indicated that even though the conflicting claims are not identical, they are not patentably distinct from each other. Once all the rejections, except for the double patenting rejection, are withdrawn, Applicants will file the appropriate Terminal Disclaimer to resolve the double patenting rejection.

The claims should be allowed and the case passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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